

ULC1001-Q1 具有 I/V 检测放大器的可配置超声波 PWM 调制器

1 特性

- 集成可编程清洁模式
 - 水 (排出)
 - 除冰 (融化和排出)
 - 泥点 (脱水和排出)
 - 自动清洁 (检测质量和排出)
 - 自定义清洁模式
- 嵌入式算法
 - 镜头系统校准
 - 自动质量检测
 - 功率调节
 - 系统诊断
- 系统诊断
 - 驱动器故障报告
 - 镜头系统故障报告
 - 传感器温度调节
- 宽驱动频率范围
 - 高效直接驱动 (10kHz - 5MHz)
 - AD 调制 (<50kHz)
- I²C 用户接口
- 所需的时钟源
 - 外部振荡器 (10MHz, 建议 5ppm)
- 电源
 - IOVDD : 3.3V
- 32 引脚 QFN-HR 封装

2 应用

- 汽车热成像摄像头
- 视镜更换/摄像头视镜系统
- 后置摄像头
- 环视系统 ECU
- 前置摄像头

3 说明

ULC1001-Q1 是一款具有电流和电压检测功能的可配置 PWM 调制器, 专用于基于压电效应的镜头清洁系统。

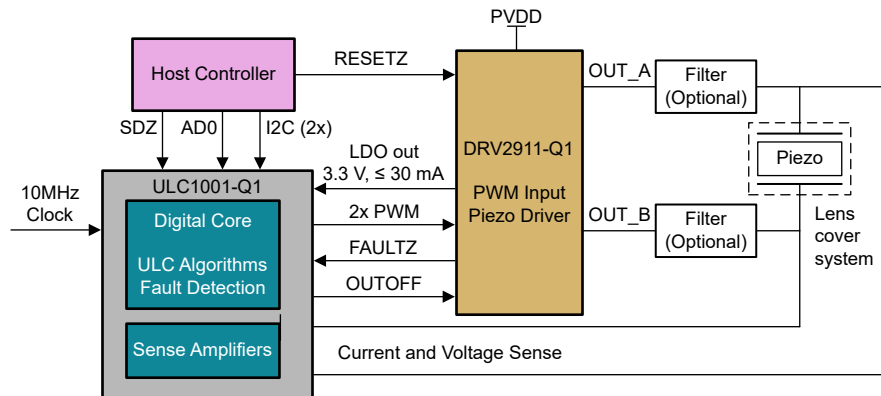
片上低延迟 DSP 支持德州仪器 (TI) 为镜头清洁设计的专有算法。ULC1001-Q1 和 DRV2911-Q1 配合使用, 创建超声波镜头清洁系统。

ULC1001-Q1 器件采用 32 引脚 QFN-HR 封装, 可实现紧凑的 PCB 尺寸。

器件信息

器件型号	封装 ⁽¹⁾	封装尺寸 ⁽²⁾
ULC1001-Q1	HRQFN	4.5mm × 5.0mm

- (1) 如需了解所有可用封装, 请参阅数据表末尾的可订购产品附录。
- (2) 封装尺寸 (长 × 宽) 为标称值, 并包括引脚 (如适用)。



简化版应用



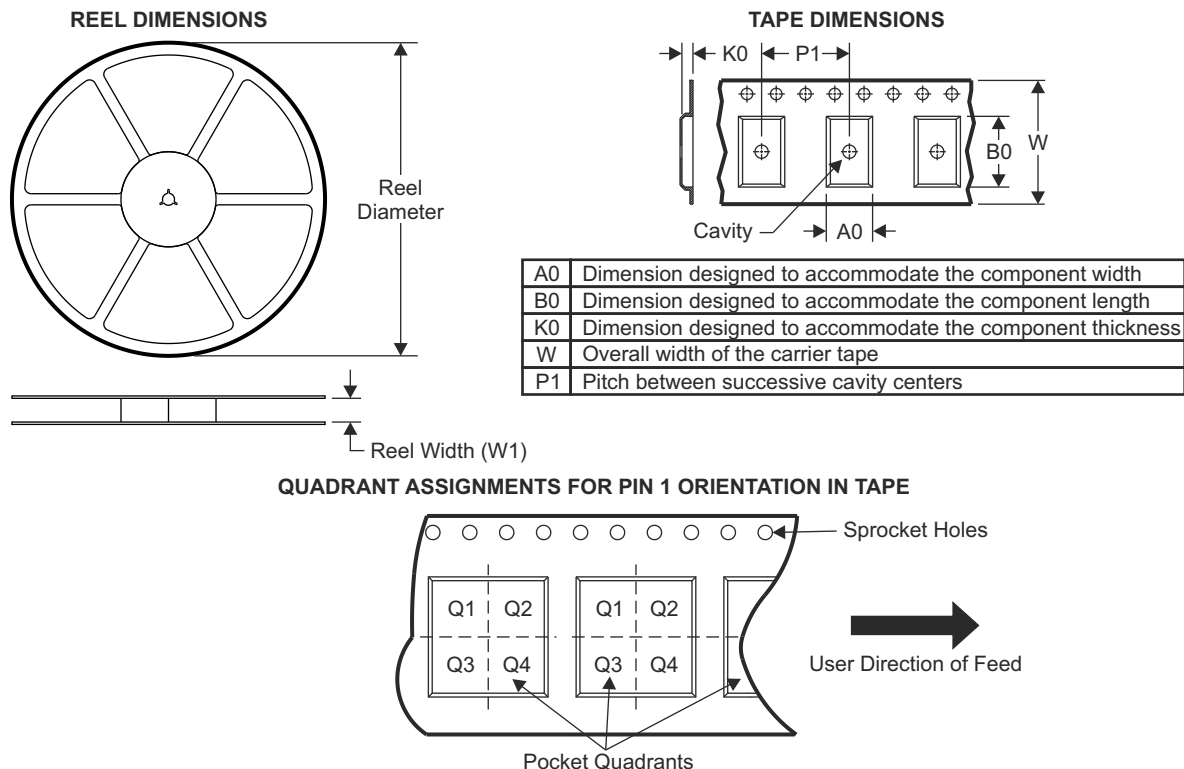
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4 机械、封装和可订购信息

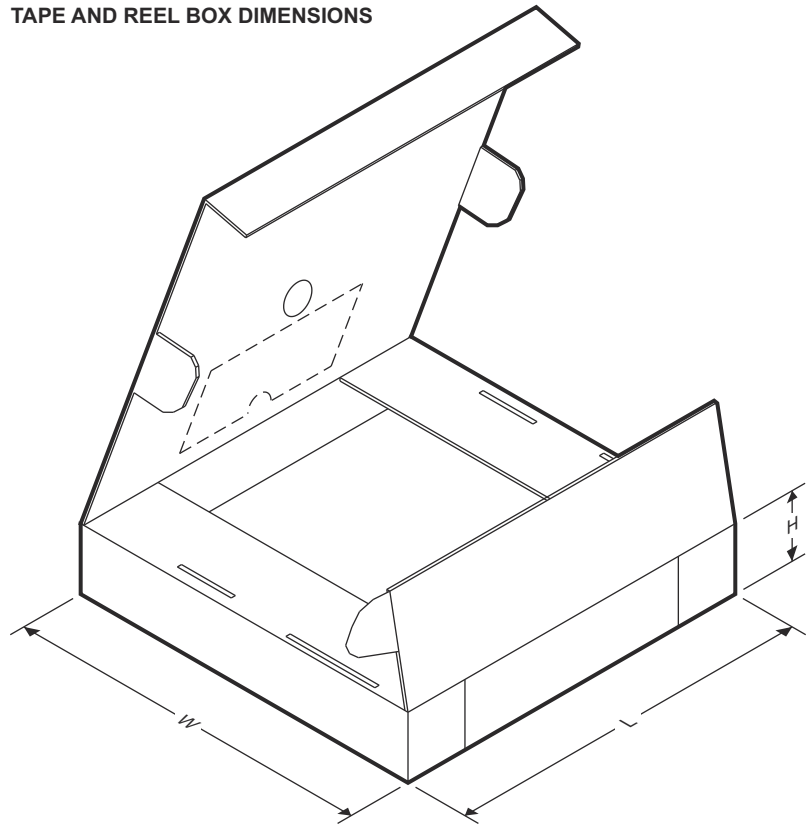
以下页面包含机械、封装和可订购信息。这些信息是指定器件可用的最新数据。数据如有变更，恕不另行通知，且不会对此文档进行修订。有关此数据表的浏览器版本，请查阅左侧的导航栏。

4.1 卷带包装信息



器件	封装类型	封装图	引脚	SPQ	卷带直径 (mm)	卷带宽度 W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 象限
ULC1001QWRQTRQ1	VQFN-HR	RTQ	32	3000	330.0	12.4	4.8	5.3	1.15	8.0	12.0	Q2

TAPE AND REEL BOX DIMENSIONS



器件	封装类型	封装图	引脚	SPQ	长度 (mm)	宽度 (mm)	高度 (mm)
ULC1001QWRQTRQ1	VQFN-HR	RTQ	32	3000	367.0	367.0	35.0

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package Pins	Package qty Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
ULC1001QWRQTRQ1	Active	Production	VQFN-HR (RQT) 32	3000 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 125	ULC 1001WQ1
ULC1001QWRQTRQ1.A	Active	Production	VQFN-HR (RQT) 32	3000 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 125	ULC 1001WQ1

⁽¹⁾ **Status:** For more details on status, see our [product life cycle](#).

⁽²⁾ **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

⁽³⁾ **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

⁽⁴⁾ **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

⁽⁵⁾ **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

⁽⁶⁾ **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "-" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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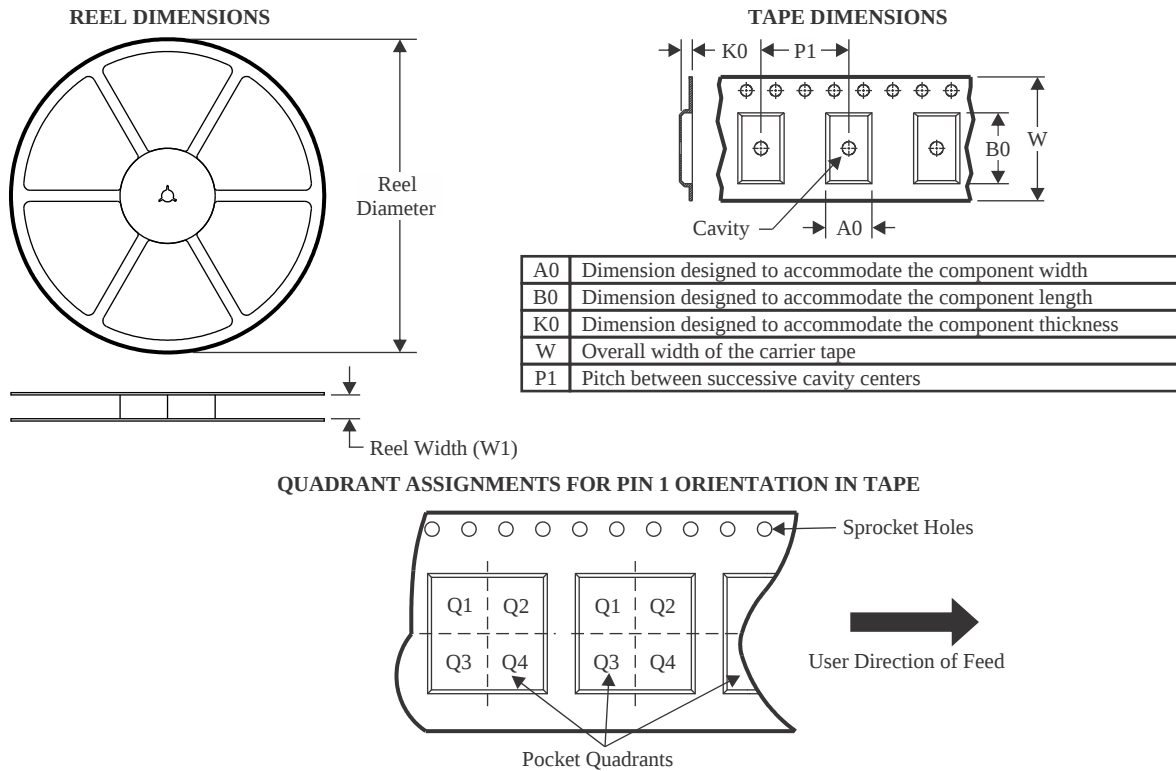
OTHER QUALIFIED VERSIONS OF ULC1001-Q1 :

- Catalog : [ULC1001](#)

NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product

TAPE AND REEL INFORMATION



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
ULC1001QWRQTRQ1	VQFN-HR	RQT	32	3000	330.0	12.4	4.8	5.3	1.15	8.0	12.0	Q2

TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
ULC1001QWRQTRQ1	VQFN-HR	RQT	32	3000	367.0	367.0	35.0

GENERIC PACKAGE VIEW

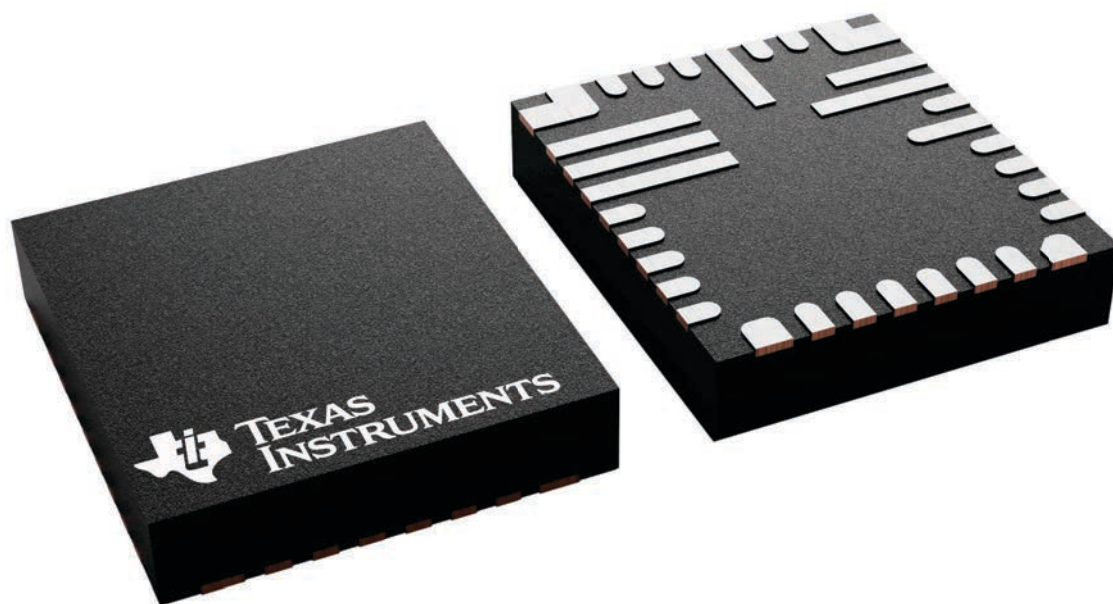
RQT 32

VQFN-HR - 1 mm max height

5 x 4.5, 0.5 mm pitch

PLASTIC QUAD FLATPACK - NO LEAD

This image is a representation of the package family, actual package may vary.
Refer to the product data sheet for package details.

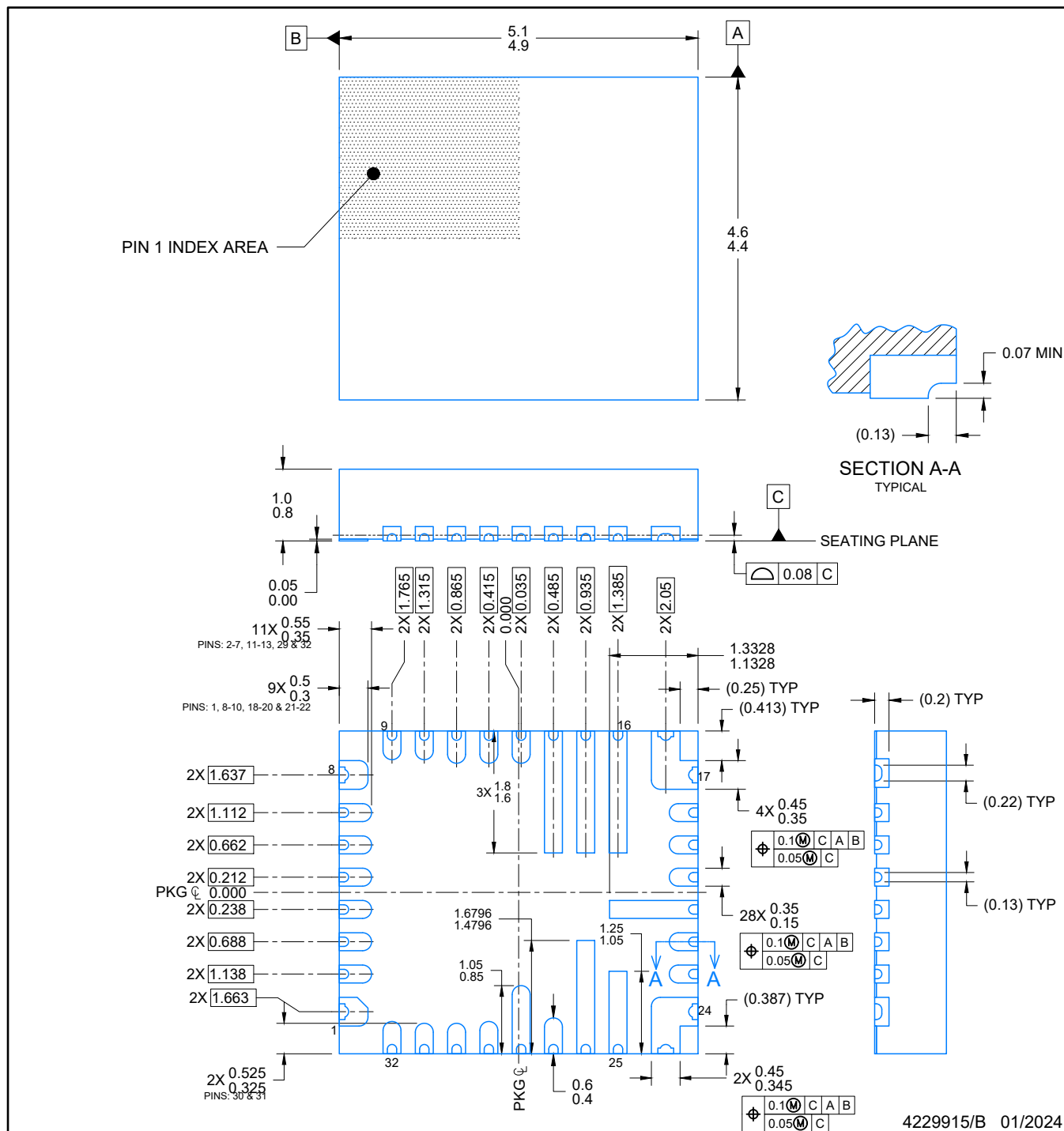


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PACKAGE OUTLINE

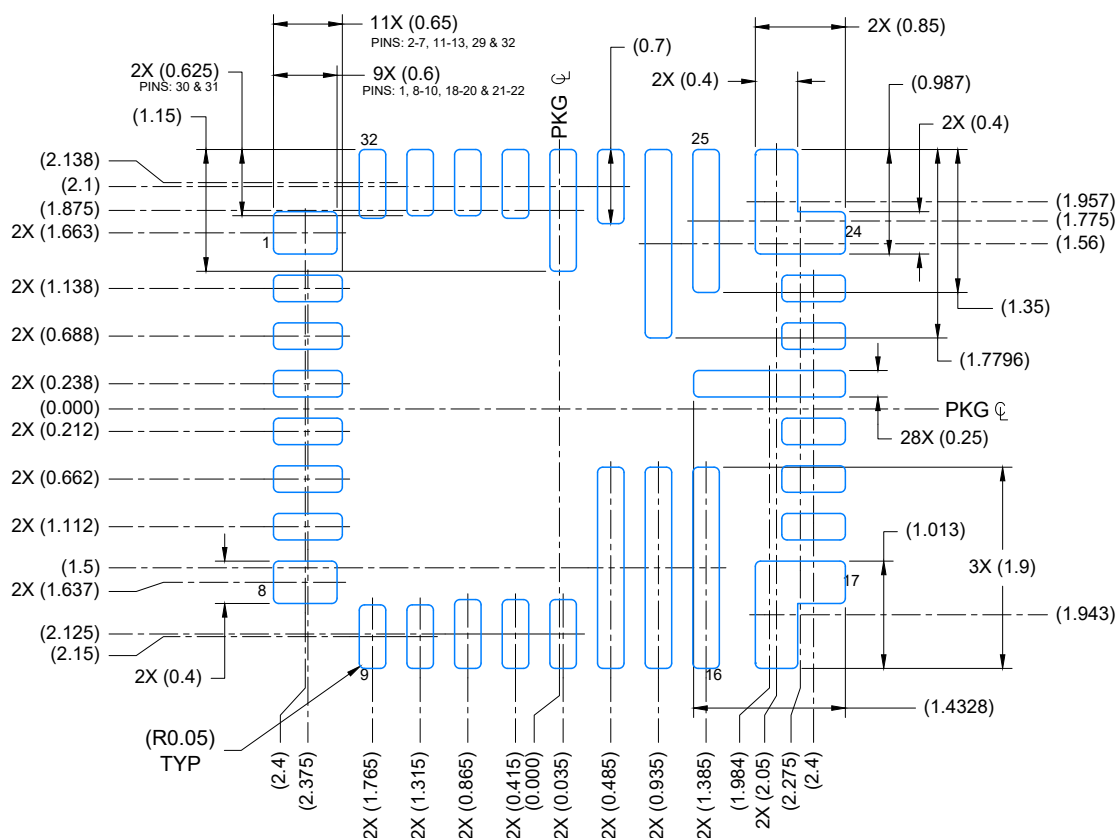
VQFN-HR - 1 mm max height

PLASTIC QUAD FLATPACK- NO LEAD

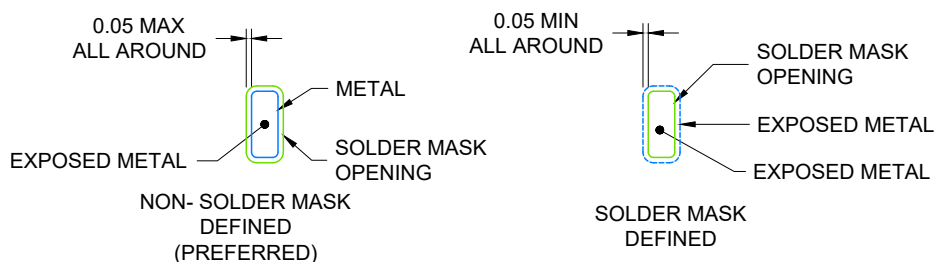


NOTES:

1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 14X

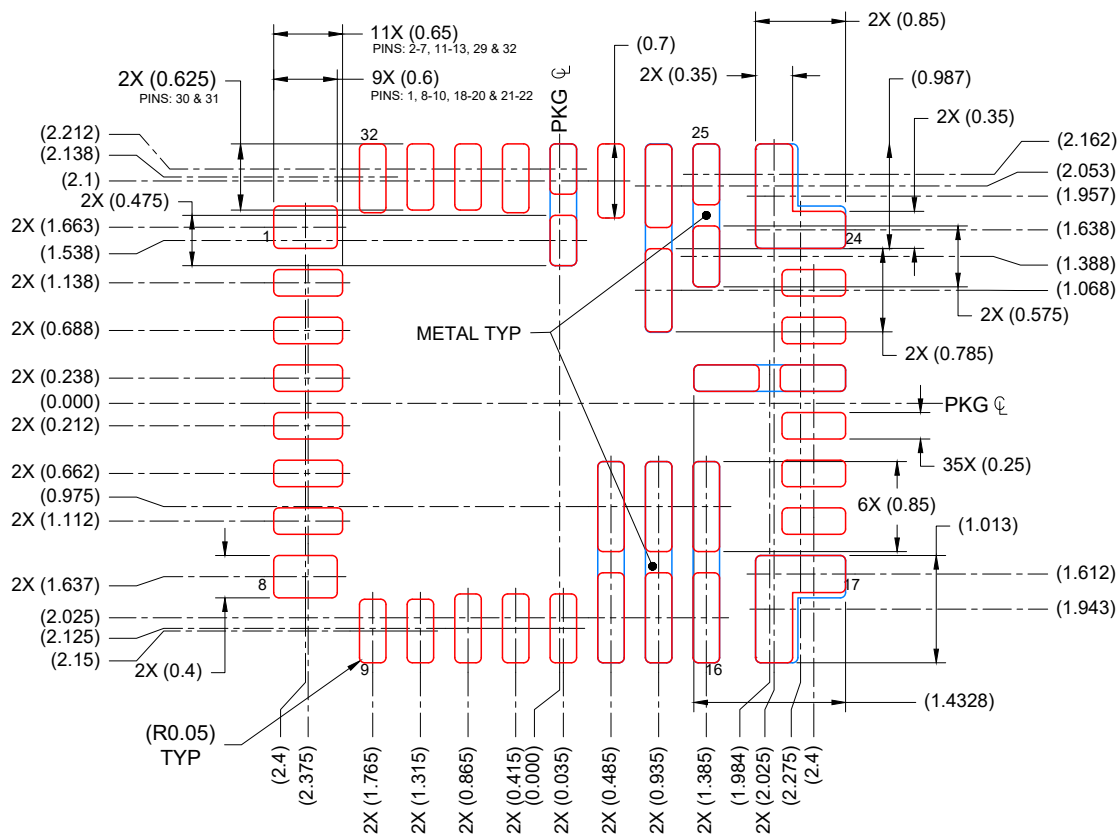


SOLDER MASK DETAILS

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NOTES: (continued)

- For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/sluea271).
- Solder mask tolerances between and around signal pads can vary based on board fabrication site.



SOLDER PASTE EXAMPLE

BASED ON 0.1 mm THICK STENCIL

SCALE: 14X

PRINTED COVERAGE BY AREA

PAD 14,15,16: 89%

PAD 21: 85%

PAD 17& 24: 90%

PAD 25: 84%

PAD 26: 88%

PAD 28: 82%

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NOTES: (continued)

5. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.

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